

Name: \_\_\_\_\_

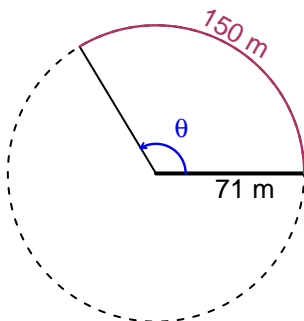
Date: \_\_\_\_\_

## Trig Final (TEST v662)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

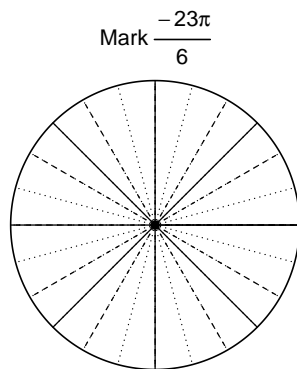
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 150 meters. The radius is 71 meters. What is the angle measure in radians?

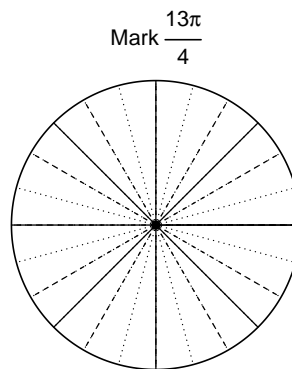


### Question 2

Consider angles  $-\frac{23\pi}{6}$  and  $\frac{13\pi}{4}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(-\frac{23\pi}{6}\right)$  and  $\sin\left(\frac{13\pi}{4}\right)$  by using a unit circle (provided separately).



Find  $\cos(-23\pi/6)$



Find  $\sin(13\pi/4)$

**Question 3**

If  $\tan(\theta) = \frac{-63}{16}$ , and  $\theta$  is in quadrant IV, determine an exact value for  $\sin(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 3.18 meters, a frequency of 4.78 Hz, and a midline at  $y = -5.89$  meters. At  $t = 0$ , the mass is at the minimum height. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).